CLAIMS

1. A packet control unit (Ra, Rb, Rc, Rd; PCU1-PCUn) for being included in a packet switched control network (PSCN) as one of a plurality of packet control units for controlling a packet traffic constituted by a plurality of packets (CP1-CPx) being routed between said packet control units along a plurality of packet routing links (PRL1-PRLm),

   said packet switched control network (PSCN) being configured in such a way that said packet routing links (PRL1-PRLm) and said packet control units (Ra, Rb; PCU1-PCUn) respectively correspond to path sections (RDS1-RDSm) and path points (ICP1-ICPn) of an object movement network (RDN) in which an object traffic is formed by a plurality of objects (C1-Cx) moving along said path sections (RDS1-RDSm) between said path points (ICP1-ICPn), and

   each path point (ICP1-ICPn) of said object movement network (RDN) having associated with it a traffic information unit (TIU1-TIUy) adapted at least to detect the arrival of objects (C1-Cx) at the path point (ICP1-ICPn) and to output a corresponding object arrival information (VAI1-VAIy), including

a transmission device (TR) adapted to send respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network (PSCN) for the controlling of said packet traffic;

a reception device (REC) adapted to receive packets from other packet control units (PCU1-PCUn) of said packet

switched control network (PSCN) and at least one object arrival information (VAI1-VAIy) indicating the arrival of an object (CR1-CRx) at one of said path points (Px; ICP1-ICPn); and

a synchronisation device (SYNC) adapted to cause the sending of a packet corresponding to said object to the packet control unit (Rx) corresponding to said path point (Px) at which the object arrival was detected by its associated traffic information unit.

2. A packet control unit (Rx; PCU1-PCUn) for being included in a packet switched control network (PSCN) as one of a plurality of packet control units for controlling a packet traffic constituted by a plurality of packets (CP1-CPx) being routed between said packet control units along a plurality of packet routing links (PRL1-PRLm),

said packet switched control network (PSCN) being configured in such a way that said packet routing links (PRL1-PRLm) and said packet control units (Ra, Rb; PCU1-PCUn) respectively correspond to path sections (RDS1-RDSm) and path points (ICP1-ICPn) of an object movement network (RDN) in which an object traffic is formed by a plurality of objects (C1-Cx) moving along said path sections (RDS1-RDSm) between said path points (ICP1-ICPn), and

each path point (ICP1-ICPn) of said object movement network (RDN) having associated with it a traffic information unit (TIU1-TIUy) adapted at least to detect the arrival of objects (C1-Cx) at the path point (ICP1-ICPn) and to output a corresponding object arrival information (VAI1-VAIy), including

a transmission device (TR) adapted to send respective packets onto a packet routing link to a succeeding

target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network (PSCN) for the controlling of said packet traffic;

a reception device (REC) adapted to receive packets from other packet control units (PCU1-PCUn) of said packet switched control network (PSCN) and an object arrival information (VAI1-VAIy) indicating the arrival of an object (CR1-CRx) at the path point (Px; ICP1-ICPn) corresponding to said packet control unit (Rx); and

a synchronisation device (SYNC) adapted to cause the sending of a packet corresponding to said object to the packet control unit (Rx) if a received object arrival information indicates the arrival of an object (CR1-CRx) at the path point (Px; ICP1-ICPn) corresponding to said packet control unit (Rx),

said reception device (REC) being also adapted to receive said sent packet corresponding to said object.

3. A packet control unit (Ra, Rb; PCU1-PCUn) for being included in a packet switched control network (PSCN) as one of a plurality of packet control units for controlling a packet traffic constituted by a plurality of packets (CP1-CPx) being routed between said packet control units along a plurality of packet routing links (PRL1-PRLm),

said packet switched control network (PSCN) being configured in such a way that said packet routing links (PRL1-PRLm) and said packet control units (Ra, Rb; PCU1-PCUn) respectively correspond to path sections (RDS1-RDSm) and path points (ICP1-ICPn) of an object movement network (RDN) in which an object

traffic is formed by a plurality of objects (C1-Cx) moving along said path sections (RDS1-RDSm) between said path points (ICP1-ICPn), and

each path point (ICP1-ICPn) of said object movement network (RDN) having associated with it a traffic information unit (TIU1-TIUy) adapted at least to detect the arrival of objects (C1-Cx) at the path point (ICP1-ICPn) and to output a corresponding object arrival information (VAI1-VAIy), including

a transmission device (TR) adapted to send respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network (PSCN) for the controlling of said packet traffic;

a reception device (REC) adapted to receive packets from other packet control units (PCU1-PCUn) of said packet switched control network (PSCN) and object arrival information (VAI1-VAIy) indicating the arrival of objects (CR1-CRx) at one or more path points (Px; ICP1-ICPn); and

a synchronisation device (SYNC) adapted to delete a packet in said packet control unit (Ra; Rb) if an object arrival information (VAI1-VAIy) indicating the arrival of an object corresponding to said packet at a path point (Pb) is not received within a predetermined time interval (p1-p2) by said reception device (REC).

4. A packet control unit (Ra) according to claim 1, *characterized in that*

said synchronisation device (SYNC) is adapted to cause said transmission device (TR) to send to said packet control unit (Rx) corresponding to said path point (Px) at which the object arrival was detected a packet stored at said packet control unit (Ra) and to be transmitted to said target packet control unit (Rb).

5. A packet control unit (Rb, PCU) according to claim 2, *characterized in that* said synchronisation device (SYNC) is adapted to cause a transmission device (TR) of another packet control unit (Ra) corresponding to a path point (Pa) from which said object has moved to the path point (Pb) for which the object arrival has been detected, to send to said packet control unit (Rb) corresponding to said path point (Pb) at which the object arrival was detected a packet stored at said another packet control unit (Ra) and to be transmitted to said packet control unit (Rb).

6. A packet control unit (Ra) according to claim 1, *characterized in that* said synchronisation device (SYNC) is adapted to cause said transmission device (TR) to send to said packet control unit (Rx) corresponding to said path point (Px) at which the object arrival was detected a copy of a packet stored at said packet control unit (Ra) and sent to said target packet control unit (Rb).

7. A packet control unit (Ra) according to claim 1, *characterized in that* said synchronisation device (SYNC) is adapted to store a packet link information (PLI) indicating the target packet control unit (Rb) to which the packet has been sent by said transmission device (TR) wherein said synchronisation device (SYNC) is adapted to cause the target packet control unit (Rb) identified by the stored packet link information (PLI) to send the packet to the

packet control unit (Rx) corresponding to said path point (Px) at which the object arrival was detected.

8. A packet control unit (Ra) according to claim 1, *characterized in that*
said synchronisation device (Ra), upon receipt of said object arrival information, is adapted to broadcast to all its adjacent packet control units (Rb, Rc) a packet search request (PFWD) to cause said target packet control unit (Rb) to send a packet to the packet control unit (Rx) corresponding to said path point (Px) at which the object arrival was detected.

9. A packet control unit (Ra) according to claim 3, *characterized in that*
when said transmission device (TR) of said packet control unit (Ra) plans to sent a packet to its succeeding target packet control unit (Rb) and no object arrival information for an object corresponding to this packet is generated from the traffic information unit at the path point (Pb) corresponding to the target packet control unit (Rb) or any other packet control unit (e.g. Rx) within said predetermined time interval, said synchronisation device (SYNC) is adapted cause a deletion device (DEL) to cancel said packet before said transmission device (TR) sends it to said target packet control unit (Rb).

10. A packet control unit (Rx) according to claim 1, *characterized in that*
said synchronisation device (SYNC) is adapted to cause a generation device (GEN) to generate a new packet and to cause said transmission device (TR) to send to said packet control unit (Rb) corresponding to said path point (Pb) at which the object arrival was detected said newly generated packet.

11. A traffic management system (TMSYS) for managing in a network (RDN) the object traffic formed, on a physical layer (PL), by

a1) a plurality of objects (C1-Cx) moving along

a2) a plurality of path sections (RDS1-RDSm) of the network (RDN) and

a3) a plurality of path points (ICP1-ICPn) located at said path sections (RDS1-RDSm) of the network (RDN), and

a4) each path point (ICP1-ICPn) having associated with it a traffic information unit (TIU1-TIUy) adapted at least to detect the arrival of objects (C1-Cx) at the respective path point (ICP1-ICPn) and to output a corresponding object arrival information (VAI1-VAIy), comprising:

a packet switched control network (PSCN) on a traffic control layer (TCL) in which the packet traffic constituted by

b1) a plurality of packets (CP1-CPx) being routed along

b2) a plurality of packet routing links (PRL1-PRLm) is controlled by

b3) a plurality of packet control units (PCU1-PCUn) located at said packet routing links (PRL1-PRLm) for controlling the packet traffic in said packet switched control network (PSCN) such that each packet (CP1-CPx) routed along a respective packet routing link (PRL1-PRLm) corresponds to one object (CR1-CRx) moving on a corresponding path section (RDS1-RDSm);

b4) each packet control unit being constituted as defined in claim 1 or claim 2 or claim 3 and being adapted to send, with the respective transmission device (TR), as a source packet control unit respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network (PSCN) for the controlling of said packet traffic;

wherein said packet switched control network (PSCN) on the traffic control layer (TCL) is configured in such a way that

c1) packet routing links (PRL1-PRLm) correspond to path sections (RDS1-RDSm); and

c2) packet control units (PCU1-PCUn) correspond to path points (ICP1-ICPn); wherein

c3) when a traffic information unit (e.g. TIU1) detects the arrival of an object (C1-Cx) at its associated path point (e.g. Px) and outputs a corresponding object arrival information (VAI1-VAIy), and

an arrival packet control unit (e.g. Rx) corresponding to said path point (Px) does not detect the arrival of a packet corresponding to said object,

a synchronisation packet control unit (e.g. Ra) is adapted to send a packet corresponding to said object to said arrival packet control unit (Rx) to synchronize the packet routing and the object movement.

12. A system according to claim 11,
characterized in that
said traffic information units (TIU1-TIUy) are also adapted to guide an object onto a path section to a succeeding path point corresponding to a target packet control unit determined by the source packet control unit in accordance with said routing decision.

13. A system according to claim 11 including at least one packet control unit constituted as defined in claim 8,
characterized in that
said packet search request (PFWD) is constituted by a search packet (SP) sent to said adjacent packet control units.

14. A system according to claim 13,
characterized in that
said search packet (SP) comprises a life time field indicating the life time of said search packet (SP) wherein said adjacent packet control units comprise a deletion device (DEL) adapted to delete said search packet (SP) if the life time field indicates a life time exceeding a maximum allowable life time.

15. A method for managing in a network (RDN) the object traffic formed, on a physical layer (PL), by

a1) a plurality of objects (C1-Cx) moving along

a2) a plurality of path sections (RDS1-RDSm) of the network (RDN) and

a3) a plurality of path points (ICP1-ICPn) located at said path sections (RDS1-RDSm) of the network (RDN),

a4) each path point (ICP1-ICPn) having associated with it a traffic information unit (TIU1-TIUy) adapted at least to detect the arrival of objects (C1-Cx) at the respective path point (ICP1-ICPn) and to output a corresponding object arrival information (VAI1-VAIy),

by controlling in a packet switched control network (PSCN) on a traffic control layer (TCL) the packet traffic constituted by

b1) a plurality of packets (CP1-CPx) being routed along

b2) a plurality of packet routing links (PRL1-PRLm) by means of

b3) a plurality of packet control units (PCU1-PCUn) located at said packet routing links (PRL1-PRLm);

b4) each packet control unit being adapted to send as a source packet control unit respective packets onto a packet routing link to a succeeding target packet control unit on the basis of a respective routing decision in accordance with a predetermined packet routing method used in said packet switched control network (PSCN) for the controlling of said packet traffic;

wherein said packet switched control network (PSCN) on the traffic control layer (TCL) is configured in such a way that

c1) packet routing links (PRL1-PRLm) correspond to path sections (RDS1-RDSm); and

c2) packet control units (PCU1-PCUn) correspond to path points (ICP1-ICPn); and wherein said controlling of

said packet control unit is performed in such a way that

c3) each packet (CP1-CPx) routed along a respective packet routing link (PRL1-PRLm) corresponds to one object (CR1-CRx) moving on a corresponding path section (RDS1-RDSm); comprising the following steps:

detecting an object arrival at one of said path points (Px; ICP1-ICPn) and generating a corresponding object arrival information (VAI1-VAIy); and

causing a packet control unit to send a packet corresponding to said object to the packet control unit (Rx) corresponding to said path point (Px) at which the object arrival was detected.